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What is claimed is:

- 1 1. A router for a hierarchical communication network which is
2 divided into a plurality of areas in each of which a plurality of said router are
3 interconnected by links, comprising:
4 a first table having a plurality of entries respectively corresponding to
5 reachable destinations, each of the entries including an intra-area or an inter-
6 area indication and an area identifier identifying at least one traversable area;
7 a plurality of second tables respectively corresponding to said areas,
8 each of the second tables holding quality-of-service (QoS) values of the links
9 of the corresponding area; and
10 a processor, responsive to a request signal specifying a destination and
11 a QoS value, for making reference to one of the entries of the first table and
12 one of the second tables corresponding to the specified destination, selecting
13 links of the area identified by the area identifier of the referenced entry which
14 links satisfy the specified QoS value, and performing a calculation according
15 to a shortest path finding algorithm on the selected links to find a shortest
16 path to the specified destination if the intra-area indication is included in the
17 referenced entry, or performing said shortest path calculation on the selected
18 links to find a shortest path tree in the identified area and determining a
19 route from the shortest path tree.
- 1 2. A router for a hierarchical communication network which is
2 divided into a plurality of areas in each of which a plurality of said router are
3 interconnected by links, wherein neighboring ones of said areas are

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4 interconnected by at least one area border router, comprising:
5 a first table having a plurality of entries respectively corresponding to
6 reachable destinations, each of the entries including an intra-area or an inter-
7 area indication, an area identifier identifying at least one traversable area,
8 and a list of area border routers if said inter-area indication is included;
9 a plurality of second tables respectively corresponding to said areas,
10 each of the second tables holding quality-of-service (QoS) values of the links
11 of the corresponding area; and
12 a processor, responsive to a request signal specifying a destination and
13 a QoS value, for making reference to one of the entries of the first table and
14 one of the second tables corresponding to the specified destination, selecting
15 links of the area identified by the area identifier of the referenced entry which
16 links satisfy the specified QoS value, and performing a calculation according
17 to a shortest path finding algorithm on the selected links to find a shortest
18 path to the specified destination if the intra-area indication is included in the
19 referenced entry, or performing said shortest path calculation on the selected
20 links until a shortest path tree is found for all routers of the list of the
21 referenced entry or until an end of the calculation is reached when said tree is
22 not found for all said routers if the inter-area indication is included in the
23 referenced entry, and determining from the shortest path tree a route having
24 an optimum QoS value.

1 3. The router of claim 1, further comprising a third table
2 corresponding to a destination reachable via at least one traversable area, said
3 third table containing a plurality of router identifiers identifying a plurality of

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4 area border routers and a plurality of QoS values of routes from said plurality
5 of area border routers to the destination, wherein said processor is configured
6 to determine said route depending on said plurality of QoS values.

1 4. The router of claim 3, wherein said third table further contains a
2 plurality of two hop count values of said routes from said plurality of area
3 border routers to the destination, and wherein said processor is configured to
4 determine said route to one of said plurality of area border routers depending
5 on hop count values of said traversable area plus the hop count values of said
6 third table.

1 5. A hierarchical communication network which is divided into a
2 plurality of areas in each of which a plurality of said router are
3 interconnected by links, each of said routers comprising:
4 a first table having a plurality of entries respectively corresponding to
5 reachable destinations, each of the entries including an intra-area or an inter-
6 area indication and an area identifier identifying at least one traversable area;
7 a plurality of second tables respectively corresponding to said areas,
8 each of the second tables holding quality-of-service (QoS) values of the links
9 of the corresponding area; and
10 a processor, responsive to a request signal specifying a destination and
11 a QoS value, for making reference to one of the entries of the first table and
12 one of the second tables corresponding to the specified destination, selecting
13 links of the area identified by the area identifier of the referenced entry which
14 links satisfy the specified QoS value, and performing a calculation according

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15 to a shortest path finding algorithm on the selected links to find a shortest
16 path to the specified destination if the intra-area indication is included in the
17 referenced entry, or performing said shortest path calculation on the selected
18 links to find a shortest path tree in the identified area and determining a
19 route from the shortest path tree.

1 6. A hierarchical communication network which is divided into a
2 plurality of areas in each of which a plurality of routers are interconnected by
3 links, wherein neighboring ones of said areas are interconnected by at least
4 one area border router, each of the routers comprising:
5 a first table having a plurality of entries respectively corresponding to
6 reachable destinations, each of the entries including an intra-area or an inter-
7 area indication, an area identifier identifying at least one traversable area,
8 and a list of area border routers if said inter-area indication is included;
9 a plurality of second tables respectively corresponding to said areas,
10 each of the second tables holding quality-of-service (QoS) values of the links
11 of the corresponding area; and
12 a processor, responsive to a request signal specifying a destination and
13 a QoS value, for making reference to one of the entries of the first table and
14 one of the second tables corresponding to the specified destination, selecting
15 links of the area identified by the area identifier of the referenced entry which
16 links satisfy the specified QoS value, and performing a calculation according
17 to a shortest path finding algorithm on the selected links to find a shortest
18 path to the specified destination if the intra-area indication is included in the
19 referenced entry, or performing said shortest path calculation on the selected

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20 links until a shortest path tree is found for all routers of the list of the
21 referenced entry or until an end of the calculation is reached when said tree is
22 not found for all said routers if the inter-area indication is included in the
23 referenced entry, and determining from the shortest path tree a route having
24 an optimum QoS value.

1 7. The network of claim 6, wherein each of said routers further
2 comprises a third table corresponding to a destination reachable via at least
3 one traversable area, said third table containing a plurality of router
4 identifiers identifying a plurality of area border routers and a plurality of QoS
5 values of routes from said plurality of area border routers to the destination,
6 wherein said processor is configured to determine said route depending on
7 said plurality of QoS values.

1 8. The network of claim 7, wherein said third table further
2 contains a plurality of two hop count values of said routes from said plurality
3 of area border routers to the destination, and wherein said processor is
4 configured to determine said route to one of said plurality of area border
5 routers depending on hop count values of said traversable area plus the hop
6 count values of said third table.

1 9. A routing method for a hierarchical communication network
2 which is divided into a plurality of areas in each of which a plurality of said
3 router are interconnected by links, each of said routers comprising a first
4 table having a plurality of entries respectively corresponding to reachable

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destinations, each of the entries including an intra-area or an inter-area indication and an area identifier identifying at least one traversable area, and a plurality of second tables respectively corresponding to said areas, each of the second tables holding quality-of-service (QoS) values of the links of the corresponding area, each of said routers functioning as a source router when a request signal is received, the method comprising the steps of:

- receiving, at the source router, a request signal specifying a destination and a QoS value and making reference to one of the entries of the first table and one of the second tables corresponding to the specified destination;
- selecting links of the area identified by the area identifier of the referenced entry which links satisfy the specified QoS value; and
- performing a calculation according to a shortest path finding algorithm on the selected links to find a shortest path to the specified destination if the intra-area indication is included in the referenced entry, or performing said shortest path calculation on the selected links to find a shortest path tree in the identified area and determining a route from the shortest path tree.

1 10. A routing method for a hierarchical communication network
2 which is divided into a plurality of areas in each of which a plurality of
3 routers are interconnected by links, the routers of neighboring areas being
4 interconnected by at least one area border router, wherein each of the routers
5 functions as a source router when a request signal is received and includes a
6 first table having a plurality of entries respectively corresponding to

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7 reachable destinations, each of the entries including an intra-area or an inter-
8 area indication, an area identifier identifying at least one traversable area,
9 and a list of area border routers if said inter-area indication is included, and a
10 plurality of second tables respectively corresponding to said areas, each of the
11 second tables holding quality-of-service (QoS) values of the links of the
12 corresponding area, the method comprising the steps of:

13 a) receiving, at said source router, a request signal specifying a
14 destination and a QoS value, for making reference to one of the entries of the
15 first table and one of the second tables corresponding to the specified
16 destination;
17 b) selecting links of the area identified by the area identifier of the
18 referenced entry which links satisfy the specified QoS value; and
19 c) performing a calculation according to a shortest path finding
20 algorithm on the selected links to find a shortest path to the specified
21 destination if the intra-area indication is included in the referenced entry, or
22 performing said shortest path calculation on the selected links until a shortest
23 path tree is found for all routers of the list of the referenced entry or until an
24 end of the calculation is reached when said tree is not found for all said
25 routers if the inter-area indication is included in the referenced entry, and
26 determining from the shortest path tree a route having an optimum QoS
27 value.

1 11. The method of claim 10, wherein each of said routers further
2 comprises a third table corresponding to a destination reachable via at least
3 one traversable area from said source router, said third table containing a

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- 4 plurality of router identifiers identifying a plurality of area border routers
- 5 and a plurality of QoS values of routes from said plurality of area border
- 6 routers to the destination, wherein the step (c) determines said route
- 7 depending on said plurality of QoS values.

- 1 12. The method of claim 11, wherein said third table further
- 2 contains a plurality of two hop count values of said routes from said plurality
- 3 of area border routers to the destination, and wherein the step (c) comprises
- 4 the step of determining said route to one of said plurality of area border
- 5 routers depending on hop count values of said traversable area plus the hop
- 6 count values of said third table.